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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/694,722	10/29/2003	Tomohiro Azuma	Q77946	4037
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WANG, TED M				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/694,722

Applicant(s)

AZUMA, TOMOHIRO

Examiner

TED M. WANG

Art Unit

2611

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 and 25 is/are pending in the application.
- 4a) Of the above claim(s) 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 12 is/are rejected.
- 7) ☒ Claim(s) 2, 11, 13-22 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/06)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed on 2/2/2009, with respect to claims 1-11 have been considered but are moot in view of the new ground(s) of rejection.
2. Applicant's arguments, filed on 2/2/2009, have been fully considered but they are not persuasive. The Examiner has thoroughly reviewed Applicants' arguments but firmly believes that the cited reference to reasonably and properly meet the claimed limitations.

Independent Claim 12

- (1) *Applicants' argument* – "With respect to claim 12, Applicant respectfully disagrees. Claim 12 recites "[a] **method** of calibrating a transmission route used by an array **antenna transceiver** for performing wide-band transmission." As such, claim 12 is sufficiently tied to another statutory category -- "an array antenna transceiver." For at least this reason Applicant respectfully requests for this rejection to be withdrawn. " as recited in page 12 of the remark, dated 2/2/2009.

Examiner's response –

"Identifying the apparatus" requires that the process claim explicitly recite the particular machine or apparatus, or recite a step that inherently involves the use of a particular machine or apparatus.

The definition of an "inherent tie" is as follows:

The step requires a particular machine or apparatus such that the step cannot be performed mentally or manually in a manner that reasonably accomplishes the intended purpose of the recited invention, as claimed, without the use of a structure.

Claim 12 of the instant application stated that

12. (currently amended): A method of calibrating a transmission route used by an array antenna transceiver for performing wide-band transmission by a multicarrier, comprising:

a step of grouping all subcarriers into a plurality of subcarrier groups and calibrating a transmission route for each group.

Claim 12 fails to meet the condition of being "tied" a particular machine or apparatus is:

Although an "array antenna" (a particular machine) is recited in connection with the "method", it is not required in the performing of the step (a step of grouping and calibrating) itself and therefore is neither an explicitly recited structural tie nor inherently involved in the step.

Absent a special definition in the specification limiting the selecting step to a machine implementation, **this claim is not properly tied.**

Thus, for the explanation addressed in the above paragraph, the rejection under 35 U.S.C. 101 is adequate.

Independent Claims 1 and 12

(2) *Applicants' argument* – "With respect to independent claim 1, Farlow fails to disclose, or even suggest at least a "means for grouping all subcarriers into a plurality of subcarrier groups." Instead, Farlow simply describes separating a signal into a plurality of spatial channels and then calibrating the signal for each individual spatial channel. In other words, when the device of Farlow wants to transmit a signal, and includes "M" spatial channels (paths), the signal will be sent along M spatial channels (paths): "[t]he wireless signal is simultaneously transmitted over M selected antennas from the set of antennas 233 through 238." (See Col. 7, 11. 16-19). In accordance with Farlow, each spatial channel will have its own set of spatial weights (calibration coefficients). (See Col. 4, 11.33-36; see also Col. 5, 11.51-58). Thus, the signal sent along each spatial channel (path) will be calibrated differently for each path. Accordingly, the signal being sent along each path in Farlow is the same signal, but one that is calibrated differently for each spatial path. Conversely, claim 1 requires "grouping all subcarriers into a plurality of subcarrier groups," which is the opposite of sending the same signal along M differently calibrated paths. In fact, there is simply no disclosure of even the claimed "plurality of subcarriers," nor is there any disclosure of "grouping all subcarriers into a plurality of subcarrier groups," as required by claim 1. For at least this reason, claim 1 overcomes the cited art of record. " as recited in pages 14-15 of the remark, dated 2/2/2009.

Examiner's response –

(a) The amended Claim 1 of the instant application fails to meet the 35 USC 112 sixth paragraph requirements since the written description fails to disclose the corresponding structure, material, or acts for the claimed function. Page 10, lines 1-28 of instant application recited “an array antenna transceiver under operation of a system for performing broadband transmission by a multicarrier, which comprises demodulation symbol area determining means (112 in FIG.1) for classifying and grouping demodulation symbol points (phase/amplitude information) of calibration signals transmitted from all subcarriers in all transmission routes for each area, calibration subcarrier selecting means (113 in FIG.1) for selecting one demodulation symbol serving as a typical value and its transmission route number and subcarrier number from a demodulation symbol groups grouped for each area, calibration control means (114 in FIG.1)”. It does not teach means for grouping and means for calibrating as recited in claim 1.

(b) The claim 1 limitation does not exclude that the signal being sent along each path in Farlow is the same signal. The claim limitation requires only grouping (Fig.2A element 211 and Fig.5 element 500) all subcarriers into a plurality of subcarrier groups (Fig.2B element 207 output and Fig.5 element 207 output and column 6 lines 9-16, where In OFDM systems, **block 205 (shown as mod'lt) maps data bits to symbols for data-carrying subcarriers (or plurality of subcarriers)**) and sets the training tones to the appropriate amplitude and phase.

For other modulation formats, the modulator uses appropriate modulating techniques. Block 206 (shown as serial to parallel) converts the signal to parallel format for processing by DFT 207 where it is converted to the frequency domain (DFT 207 is bypassed for an OFDM application.) into a plurality of subcarrier groups (Fig.2A element 211 output and Fig.5 elements 212-214 outputs,) and calibrating a transmission route for each group (Fig.5 element 504 and column 6 lines 17-21).

(c) Farlow teaches plurality of subcarriers (column 6 lines 9-16, where **block 205 (shown as mod'lt) maps data bits to symbols for data-carrying subcarriers (or plurality of subcarriers)** and grouping all subcarriers into a plurality of subcarrier groups (Fig.2A element 211 and 212-214, where 211 collects (groups) all subcarriers from elements 207 and then regroup them into a plurality of subcarrier groups. For each N-POINT IDFT 212-214, it receives an individual subcarrier group (inputs of 212-214, respectively). Whether the inputs of the element 212-214 are the same, it will still meet the claim 1 limitation "grouping all subcarriers into a plurality of subcarrier groups".

In conclusion, Farlow et al. discloses an array antenna transceiver (Fig.2A element 200 and column 2 lines 7-21) for performing broadband transmission by a multicarrier, comprising:

means for grouping (Fig.2A element 211 and Fig.5 element 500) all subcarriers (Fig.2B element 207 output and Fig.5 element 207 output and column 6 lines 9-16, where In OFDM systems, **block 205 (shown as mod'lt)**

maps data bits to symbols for data-carrying subcarriers (or plurality of subcarriers) and sets the training tones to the appropriate amplitude and phase. For other modulation formats, the modulator uses appropriate modulating techniques. Block 206 (shown as serial to parallel) converts the signal to parallel format for processing by DFT 207 where it is converted to the frequency domain (DFT 207 is bypassed for an OFDM application.) into a plurality of subcarrier groups (Fig.2A element 211 output and Fig.5 elements 212-214 outputs,) and calibrating a transmission route for each group (Fig.5 element 504 and column 6 lines 17-21).

Where Fig.5 and column 6 lines 17-21 of Farlow's reference specifically teaches that the calibration coefficients, $c_{i,k}$, where $i = 1, \dots, M$ and $k = 1, \dots, N$, are used to calibrate each spatial channel. The calibration coefficients are applied in the frequency domain to compensate for frequency-selective amplitude and phase errors. Since the calibration is done for each spatial channel, it is inherent that the transmission route for each group is calibrated.

Thus, for the explanation addressed in the above paragraph, the rejection under 35 U.S.C. 102(e) with Farlow's reference is adequate.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim element "means for grouping all subcarriers into a plurality of subcarrier groups and means for calibrating a transmission route for each group" is a means (or

step) plus function limitation that invokes 35 U.S.C. 112, sixth paragraph. However, the written description fails to disclose the corresponding structure, material, or acts for the claimed function.

- With regard claim 1, Page 10, lines 1-28 of instant application recited “an array antenna transceiver under operation of a system for performing broadband transmission by a multicarrier, which comprises demodulation symbol area determining means (112 in FIG.1) for classifying and grouping demodulation symbol points (phase/amplitude information) of calibration signals transmitted from all subcarriers in all transmission routes for each area, calibration subcarrier selecting means (113 in FIG.1) for selecting one demodulation symbol serving as a typical value and its transmission route number and subcarrier number from a demodulation symbol groups grouped for each area, calibration control means (114 in FIG.1)”. It does not teach means for grouping and means for calibrating as recited in claim 1.

Applicant is required to:

- (a) Amend the claim so that the claim limitation will no longer be a means (or step)

plus function limitation under 35 U.S.C. 112, sixth paragraph; or

- (b) Amend the written description of the specification such that it expressly recites

what structure, material, or acts perform the claimed function without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant is required to clarify the record by either:

(a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

(b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by

another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Farlow et al. (US 7,072,693).

- With regard claim 1, Farlow et al. discloses an array antenna transceiver (Fig.2A element 200 and column 2 lines 7-21) for performing broadband transmission by a multicarrier, comprising:

means for grouping (Fig.2A element 211 and Fig.5 element 500) all subcarriers (Fig.2B element 207 output and Fig.5 element 207 output and column 6 lines 9-16) into a plurality of subcarrier groups (Fig.2A element 211 output and Fig.5 elements 212-214 outputs) and means for calibrating a transmission route for each group (Fig.5 element 504 and column 6 lines 17-21).

Where Fig.5 and column 6 lines 17-21 of Farlow's reference specifically teaches that the calibration coefficients, $c_{i,k}$, where $i = 1, \dots, M$ and $k = 1, \dots, N$, are used to calibrate each spatial channel. The calibration coefficients are applied in the frequency domain to compensate for frequency-selective amplitude and phase errors. Since the calibration is done for each spatial channel, it is inherent that the transmission route for each group is calibrated.

- With regard claim 12, which are method claims, respectively, related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.

Allowable Subject Matter

7. Claims 2-11, 13-22 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

9. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M. Wang whose telephone number is 571-272-3053. The examiner can normally be reached on M-F, 7:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chieh Fan can be reached on 571-272-3042. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Ted M Wang/
Primary Examiner, Art Unit 2611